

REMARKS

Claims 38-42 are rejected under 35 USC §112, Claims 17-20, 22-25, 29-35 and 38-44 are rejected under 35 USC §102, Claims 21, 23-28, 36, 37 and 45-47 are rejected under 35 USC §103. The applicants respectfully traverse these rejections and objection and request reconsideration of the application in view of the above amendments and the following remarks.

Claims 21, 36 and 38-42 have been canceled and Claims 17, 22 and 37 have been amended. None of these changes constitute new matter since this clarification of the claims is supported by the original disclosure.

Claim Rejections under 35 USC §112

Claims 38-42 were rejected under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the Office Action suggests that Claims 38-42 are broader in scope than the claim on which it depends, Claim 22.

Claims 38-42 have been canceled.

Claim Rejections under 35 USC §102

Claims 17-20, 22-25, 29-35 and 38-44 were rejected under 35 USC §102(b) as being anticipated by U.S. Patent no. 5,558,851 ("Miller"). The Office Action suggests that the reference teaches a crystalline zeolite prepared from silicon, germanium or both and aluminum, on which a hydrogenation promoter, such as platinum, is added by ion exchange or impregnation followed by calcination.

Claim 17 has been amended and now reads in part "treating the catalyst first with hydrogen, second with a sulfur compound; and then again with hydrogen". Claim 22 has been amended and now reads in part "a sulfur compound". Support for this language is found on page 11, line 18, through page 12, line 4, and in Claims 21 and 36, now cancelled. Claims 17 and 22 as amended now claim subject matter not found to be anticipated by Miller. This change in language has been made to Claims 17 and 22 to clarify the claimed subject matter.

Claim Rejections under 35 USC §103

Claims 23-28 were rejected under 35 USC §103(a) as being unpatentable over Miller in view of U.S. Patent no. 5,574,172 (Katsuro"). Specifically, the Office Action suggests specific silicon-germanium to aluminum atomic ratios or silica to germania ratios are not disclosed by Miller but are disclosed by Katsuro.

As noted above, Claim 22 now reads in part "a sulfur compound" and claims subject matter not found to be unpatentable by Miller in view of Katsuro. Claims 23-28 are dependent on Claim 22. Neither Miller nor Katsuro, individually or in combination, teach, disclose or suggest the presence of a sulfur compound in an aluminum-silicon-germanium zeolite on which a metal consisting essentially of platinum is deposited on the zeolite.

Claims 21, 36, 37 and 45-47 were rejected under 35 USC §103(a) as being unpatentable over Miller in view of U.S. Patent no. 5,672,796 ("Froment"). Specifically, the Office Action suggests that Miller does not teach that the catalyst is sulfided and Froment discloses a partially sulfided catalyst of ZSM-5 zeolite and platinum which is useful in aromatization processes.

Claim 17 has been amended and now reads in part "depositing a metal consisting essentially of platinum on the zeolite". Claim 22 has been amended and now reads in part "a metal consisting essentially of platinum deposited on the microporous aluminum-silicon-germanium zeolite". Claim 37 which was dependent on Claim 36, now canceled, has been amended to depend on a pending claim, Claim 22.

Miller discloses a zeolite post-treatment which includes use in intimate combination with hydrogenating components, such as tungsten, vanadium, molybdenum, rhenium, nickel, cobalt, chromium, manganese or a noble metal, such as palladium or platinum, and replacing alkali metal cations by ion exchange with metal cations, such as rare earth, Group IA, Group IIA and Group VIII metals with rare earth, Mn, Ca, Mg, Zn, Ga, Cd, Pt, Pd, Ni, Co, Ti, Al, Sn, Fe and Co being preferred (col. 12, line 62, through col. 13, line 16). Platinum is only one of several choices and possibilities. One having ordinary skill in the art would not be motivated by this reference to select platinum over the others.

Froment discloses a partially sulfided, Pt/Re loaded, essentially hydrogen-formed, crystalline aluminosilicate molecular sieve exhibiting the MFI structure and having a Si/Al ratio between about 40 and about 600 (Abstract; col. 1, lines 9-22 and lines 56-63; col. 1, line 66, through col. 2, line 3; col. 2, lines 18-25; col. 4, line 65, through col. 5, line 6). Rhenium is a required and essential component of the metal deposited on the zeolite catalyst disclosed in Froment (col. 5, lines 12-14: A minimum quantity of rhenium is required in order to help isolate the platinum clusters present on the sieve). One having ordinary skill in the art would not be motivated by this reference to select platinum without rhenium being present.

A combination of Miller and Froment does not make the present invention as claimed obvious. Miller discloses both platinum and rhenium among other metals which may be deposited on zeolite. Froment discloses the combination of platinum and rhenium deposited on zeolite. The present invention contains platinum deposited on the zeolite but does not contain rhenium deposited on the zeolite. A close reading of the Specification shows no disclosure of rhenium deposited on the zeolite nor any suggestion that the inventors contemplated deposit of rhenium on the zeolite as a feature of the present invention. Every limitation in the claims must be given effect rather than considering one in isolation from the others [In re Geerdes, 491 F2d 1260, 180 USPQ 789(CCPA 1974)]. The patentable difference of the present invention over the references is that the metal deposited on the aluminum-silicon-germanium zeolite consists essentially of platinum.

MPEP §2142 states the criteria for establishing a *prima facie* case of obviousness. Some suggestion or motivation to modify the reference is required. Such suggestion or motivation to define the metal deposited on the zeolite as consisting essentially of platinum did not exist. MPEP§2142 also requires a reasonable expectation of success. While it may have been obvious-to-try to prepare a zeolite on which a metal consisting essentially of platinum, obvious-to-try is not equivalent to a reasonable expectation of success. Further, according to MPEP§2142, the prior art reference must teach or suggest all the claim limitations. The cited references do not teach or suggest an aluminum-silicon-germanium zeolite on which a metal consisting essentially of platinum has been deposited.

Even if a *prima facie* case of obviousness were established by the cited references, the unexpected results of the claimed invention would satisfy the requirements of patentability. The

examiner's attention is respectfully directed to the Specification, pages 13-15 and 17, Example 1, Comparative Example A and Tables 1 and 2. Example 1 concerns a sulfided aluminum-silicon-germanium zeolite on which platinum has been deposited. Comparative Example A concerns a sulfided aluminum-silicon zeolite on which platinum has been deposited. In a process for aromatization of propane, the zeolite catalyst of Example 1 has selectivity for benzene-toluene-xylene (BTX) which remains constant over at least 100 hours of operation (Table 1). The BTX selectivity for the zeolite catalyst of Comparative Example A decreased significantly over the same time period (Table 2). These data demonstrate the unexpected results from a sulfided aluminum-silicon-germanium zeolite on which platinum has been deposited.

While Miller may disclose the presence of germanium and platinum in the zeolite catalyst, it does not suggest a sulfided zeolite catalyst. While Froment may disclose a sulfided zeolite catalyst, it does not suggest the presence of germanium in the zeolite. The patent application as filed demonstrates the efficacy of a sulfided aluminum-silicon-germanium zeolite on which platinum has been deposited, i.e., stable catalyst performance with relatively constant selectivity for conversion of lower alkanes to aromatics such as benzene, toluene and xylene. One having ordinary skill in the art would not be aware of these benefits from the disclosures of Miller and Froment, alone or in combination.

A Petition and Fee for Extension of Time under 37 CFR §1.136(a) is being concurrently submitted. The Commissioner is hereby authorized to charge any fees due by filing this paper or to credit any overpayment to Account No. 502025.

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JUTTU, SMITH

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On the basis of the above amendments and remarks, reconsideration of this application is requested and its allowance requested at the examiner's earliest convenience. No new matter has been added.

Respectfully submitted,


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